

Electro-Chemical Decomposition

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which they are not combined, is sufficiently distinct in numerous results of a purely chemical character; especially in those where partial decompositions only take place. and in Berthollet's experiments on the effects of quantity upon affinity: and it probably has a direct relation to, and connection with, attraction of aggregation, both in solids and fluids. It is a remarkable circumstance, that in gases and vapours, where the attraction of aggregation ceases, there likewise the decomposing powers of electricity apparently cease, and there also the chemical action of quantity is no longer evident. It seems not unlikely, that the inability to suffer decomposition in these cases may be dependent upon the absence of that mutual attractive relation of the particles which is the cause of aggregation.

260. I hope I have now distinctly stated, although in general terms, the view I entertain of the cause of electro-chemical decomposition, *as far as that cause can at present be traced and understood.* I conceive the effects to arise from forces which are *internal*, relative to the matter under decomposition—and not *external*, as they might be considered, if directly dependent upon the poles. I suppose that the effects are due to a modification, by the electric current, of the chemical affinity of the particles through or by which that current is passing, giving them the power of acting more forcibly in one direction than in another, and consequently making them travel by a series of successive decompositions and recompositions in opposite directions, and finally causing their expulsion or exclusion at the boundaries of the body under decomposition, in the direction of the current, *and that* in larger or smaller quantities, according as the current is more or less powerful (113). I think, therefore, it would be more philosophical, and more directly expressive of the facts, to speak of such a body, in relation to the current passing through it, rather than to the poles, as they are usually called, in contact with it; and say that whilst under decomposition, oxygen, chlorine, iodine, acids, etc., are rendered at its negative extremity, and combustibles, metals, alkalies, bases, etc., at its positive extremity (203). I do not believe

that a substance can be transferred in
the electric current
beyond the point where it ceases to find
particles with which
it can combine; and I may refer to the
experiments made in
air (201), and in water (231), already
quoted, for facts illus-
trating these views in the first instance;
to which I will now
add others.
261. In order to show the dependence of
the decomposition